## REMARKS

### Amendments to the Claims

Claim 1 has been amended pursuant to a telephonic conversation with the Examiner to reflect the limitation that the sensor of the present invention be capable of measuring either static or dynamic strain in an element, thereby more accurately reflecting applicant's invention. Applicant respectfully requests entry of this amendment to place the application in better condition for allowance, further prosecution, or appeal.

### Rejections Under 35 U.S.C. § 102(e)

Claims 1-3, 6, 7, 9-11, 14, 16, and 17 stand finally rejected under 35 USC 102(e) as being anticipated by U.S. Patent No. 6,409,674 to Brockway et al. (hereinafter Brockway or '674). Specifically, regarding claims 1, 11, 16, and 17, the Examiner has cited Brockway as teaching a system (105) for measuring and remotely monitoring strain in an element comprising a sensor (305) for measuring strain in said element, producing an electrical signal representative thereof; a telemetry circuit (310) electrically coupled to said sensor (305) for encoding and transmitting the electrical signal; a reader module (140) remotely located from said sensor (305) and said telemetry circuit (310) for receiving the signals representative of strain (Figs. 1-3a) (col. 9, lines 45-49) and a central module (200) in communication with said reader module (140) for storing and processing the signal representative of strain (Col. 7, line 58-Col. 8, line 7). For the following reasons, applicant respectfully traverses this ground of rejection.

In order for a claim to be anticipated by a reference under 35 U.S.C§102(e), that reference must teach or disclose each and every limitation of the claim being rejected. Applicant's amended claim 1 claims a system for measuring both static and dynamic

strain in an element that comprises a sensor for measuring strain in the element and producing an electrical signal representative of that strain. The Examiner has stated that Brockway teaches a sensor 305 for measuring strain in an element and producing the concomitant electrical signal at representative thereof. However, while Brockway does disclose a sensor (105, 305) at column 7 line 17 and column 8 line 14, applicant respectfully asserts that Brockway dosc not disclose a sensor for measuring static or dynamic strain as required by claim 1.

The only mention of the word "strain" in the Brockway patent is at col. 9 lines 30-39, which reads as follows:

> Pressure transducer 305 receives the pressure communicated by pressure transmitting catheter 315, or by any other pressure communication mechanism, at the interface at its proximal end 330. In response, pressure transducer 305 provides an electrical pressure signal that includes pressure information, such as steady-state pressure or variations in pressure. In one embodiment, pressure transducer 305 includes a semiconductor resistive strain gauge, the resistance of which varies according to the pressure communicated by pressure transmitting catheter 315. (emphasis added).

Thus the teaching in Brockway is of a pressure transducer 305 that utilizes a semiconductor strain gauge to measure pressure in an alternative embodiment. A pressure transducer having a resistance that varies with pressure can not be used to determine strain in a solid element. Stated another way, the Brockway sensor 305 is only capable of measuring strain in the sensor itself, responsive to pressure imposed upon it from a diaphragm or membrane. This device is inherently incapable of measuring static

and dynamic strain in an external element such as a spinal fusion rod as required by applicant's claim 1.

It should also be noted that Brockway includes no further description of the operation of this pressure transducer. While Brockway does assert that "...other sensors may also be used" (Col. 4 lines 64-65), the disclosure of Brockway exclusively discusses various pressure sensors and their application and implantation in the cardio-vascular system. In fact, all sensors discussed in the Brockway reference are sensors utilized to measure pressure, blood gas levels, pH levels or cardiac wall thickness. Based on the foregoing, there is no teaching in Brockway of a sensor for measuring static and dynamic strain as required by applicant's claim 1.

Regarding the rejection of applicant's independent claim 11, the comments submitted above with respect to claim 1 are equally applicable. Since Brockway does not teach or disclose a sensor for measuring static and dynamic strain in an element, claim 11 can not be anticipated thereby. In fact, even where Brockway does discuss other sensors, for example at col. 14 line 61 through col. 15 line 4, it does not discuss sensors for measuring strain, but rather for measure various parameters such as sensing blood gasses or other gasses (e.g., $O_2$ , $CO_2$), pH, electrocardiograms, and blood glucose. In another example, the system is used in conjunction with ultrasonic measurements (e.g., measuring blood flow, or measuring heart wall thickness for determining contractility, etc.).

Accordingly, while Brockway mentions other sensors in passing, it does not contemplate the use of a sensor for measuring static and dynamic strain in an element as required by applicant's independent claims 1 and 11. Furthermore, since independent

claims 1 and 11 are not anticipated under 35 U.S.C. § 102(e) to Brockway, claims 2-4, 6, 7, 9-10, 14, 16, and 17 can not be anticipated by Brockway since these claims depend from either claim 1 or claim 11, and include all the limitations hereof.

As a further note, the Examiner has stated that Brockway teaches a surface acoustic wave sensor for measuring strain as claimed in claim 6, at col. 15 lines 1-4. As discussed herein above, col. 15 lines 1-4 simply states that the Brockway system can be used "in conjunction with" ultrasonic measurements for measuring blood flow or heart wall thickness. Brockway does not, however, teach or disclose the use of an acoustic wave sensor for measuring static or dynamic strain in an element as required by applicant's claim 6. Accordingly, claim 6 can not be anticipated by the Brockway reference for this reason.

With respect to claim 7, it is asserted that Brockway teaches a system for measuring and remotely monitoring strain in an element wherein said sensor (305) for measuring strain is a miniaturized strain gauge at col. 9 lines 36-37. However, as discussed in detail herein above, col. 9 lines 36-37 of Brockway actually discloses the use of a "semi-conductor resistive strain gauge" incorporated as a component of pressure transducer 305 to measure pressure. This device is not capable of measuring either static or dynamic strain in an external element. Accordingly, Brockway actually teaches a system for measuring pressure utilizing a semiconductor resistive strain gauge, not a system for measuring strain in an element.

Rejections under 35 U.S.C. § 103(a)

Claims 4, 5, 12, and 13 stand finally rejected under 35 USC § 103(a) as being unpatentable over Brockway et al. in view of U.S. Patent No. 6,533,733 to Ericson et al.

(hereinafter Ericson). Ericson is cited for the teaching of a cantilever beam type capacitive sensor at col. 6 lines 55-62. The Examiner asserts that it would have been obvious to one of ordinary skill in the art to modify Brockway with the teachings of Ericson to arrive at the invention of claims 4, 5, 12, and 13. However, since Brockway does not teach a system for measuring strain in an element comprising a sensor for measuring strain, as discussed in detail herein above, not all claim limitations are taught by the combination of the references. Accordingly, claim 4, 5, 12, and 13 can not be held unpatentable as obvious under 35 USC § 103(a) over Brockway in view of Ericson.

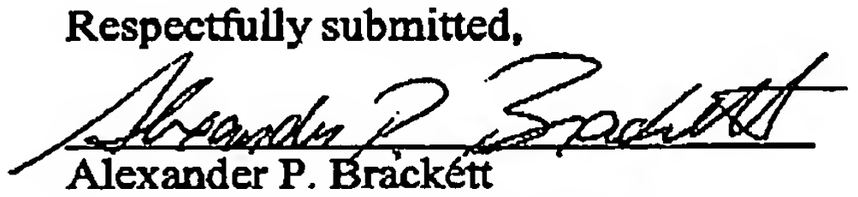
It is also critical to note that Ericson does not actually teach a cantilever beam type sensor for measuring static or dynamic strain as required by claims 4, 5, 12 and 13. Ericson, at col. 6 lines 55-62 actually discloses "cantilevered drag bodies" that are positioned within a flow stream such that strain is produced within the cantilever due to the viscous drag of fluid on the beam. This device can not be used to measure static or dynamic strain in an element. While the precise meaning of the term "cantilever drag body" in the Ericson reference is unclear, the most likely interpretation is that some form of cantilever is acted on by the movement of fluid flow. In other words, the "cantilever drag body" is actually subjected to an external force. However, the capacitive beam type sensor claimed by applicant, and shown in drawing Fig. 2 requires nothing to contact the cantilevered beam to measure strain. The applicant's invention neither uses nor claims a "cantilever drag body" device as taught by Ericson to measure static and dynamic strain. Accordingly, claims 4, 5, 12 and 13 can not be rendered obvious under 35 USC § 103(a) over Brockway in view of Ericson.

Claims 8 and 15 are also stand finally rejected under 35 USC §103(a) as being unpatentable over Brockway in view of U.S. Patent No. 6,740,075 in view of Lebel et al. Lebel is cited for the teaching of an annular housing 6. However, applicant notes that the Lebel housing 6 is not actually annular, but disc-shaped. Furthermore, the annular housing of the applicant is designed to be placed around an implant rod or other rigid element that is subjected to strain. The housing disclosed in Lebel can not be used for that purpose, only for implantation to infuse a drug into a patient. For these reasons, and for all the reasons set forth above with respect to claims 4, 5, 12, and 13, claims 8 and 15 can not be held unpatentable under 35 USC § 103(a).

Summary

Applicant has amended claim 1 responsive to the grounds of rejection set forth in the instant office action, and has responded to each ground of rejection. Applicant hereby courteously solicits the entry of the amendment to claim 1, the allowance of all claims and the prompt passage to issue of the instant application. If the Examiner believes there are other unresolved issues in this case, applicant's attorney would welcome a telephone call at (502) 584-1135 to discuss such remaining issues.

Respectfully submitted,



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